

Hobbies

WEEKLY

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How the handyman can make a HOME-MADE XYLOPHONE

THE Xylophone illustrated is a real instrument of music, having a compass of $2\frac{1}{2}$ octaves. For the notes there is some choice of wood having a certain tonal quality. Some xylophones have, in the place of the usual wooden notes, metal tubes, but these are metallic in sound and have not the mellow notes of wood.

Selected rosewood is generally used for professional instruments, but this is very expensive and generally gives way to pine which is quite a good wood except it is a bit soft to stand up to long usage.

Oak is a good second choice and is recommended for this instrument. It should be straight-grained and free from knots. It is planed to a finished size of 1in. broad and $\frac{3}{4}$ in. thick. For appearance sake, the wood is slightly rounded on its upper surface, as the detail Fig. 1 shows.

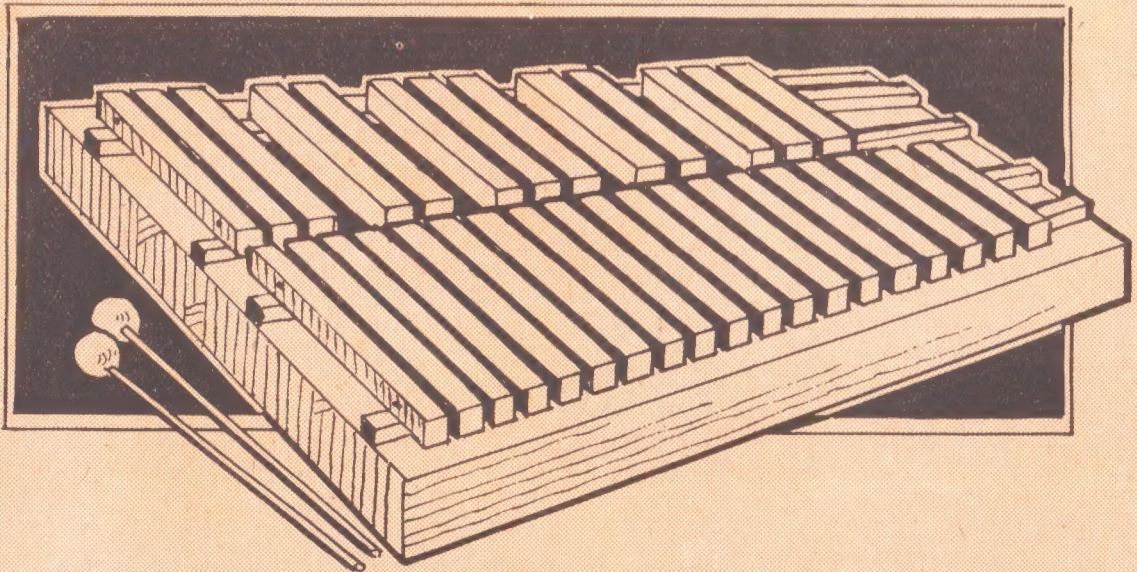
Notes and Beaters

The length of the lowest note is approximately 13 $\frac{1}{2}$ ins., and that of the highest 5 $\frac{1}{2}$ ins. These measurements are given, however, only as a guide, as different woods have different notes, though of the same length. Even

samples of the same wood and cut from a single board will vary in tonal quality.

The beaters should be made first, as they will be required for tuning as well as for actually playing the instrument later on. At (B) in Fig. 2 a pair of beaters is shown. Each consists simply of two hardwood balls about 1 $\frac{1}{2}$ ins. in diameter, with a hole bored through for a length of stout cane which must be securely glued in. A pair of ready-made beaters could be purchased, of course, at any good class instrument shop.

To lay the notes on while tuning, cut a pair of blocks off a piece of $\frac{1}{2}$ in. square fillet of stripwood, and cover these with



All correspondence should be addressed to The Editor, Hobbies Weekly, Dereham, Norfolk.

a layer or two of felt. Now for the notes. Cut off a length of wood for the lowest note, lay it across the blocks and strike it

Tuning is a tedious job and should not be continued too long at one time or the ear becomes dulled. If you cannot do it yourself, get a musical friend to undertake the job. When the notes are cut and tuned, lay them in order on the

to keep them apart. The extra space between the sharps is filled with lengths of thin rubber tubing over the cords (see Fig. 3). Do not tie the cords tightly against the wood notes but leave them free to a certain extent to just move.

The size of the sounding box upon which the instrument is mounted can now be decided. It should be just $1\frac{1}{2}$ ins. larger all round than the space occupied by the notes when the latter are laid side by side, as in Fig. 2, with a space of $\frac{3}{4}$ in. between them.

Plywood Bottom

The bottom of the sound box should be of $\frac{1}{2}$ in. wood. Plywood is best here. The sides are of $\frac{1}{2}$ in. by 2 in. wood, and the top of $\frac{1}{2}$ in. pine. Instrument pine is, perhaps, a little difficult to obtain, but it is the best for the job. The pine cannot generally be bought in wide pieces, and it will be necessary to glue together two or more boards to get the required width. A narrow strip of wood as a mid support to the top can, with advantage, be glued and screwed across underneath.

The bottom is glued and screwed to the sides, but the top is best glued only and should have a few $\frac{1}{8}$ in. holes bored or cut in it before gluing up. Two rows of six holes each will answer, and they should be made to come directly under the middle of the notes.

Note Bearers

The bearers to support the notes consist of lengths of $\frac{1}{2}$ in. square stuff, stripwood as sold by Hobbies being admirable for the purpose. The strips should be covered with baize and padded with a strip of felt beneath. A cross section through one of the strips is shown in Fig. 4.

Glue the bearers on the box to come directly under the cords which fasten the notes together, and lay the latter on top. The diagram (Fig. 5), which again is a cross section of the box, etc., gives the appearance of the finished instrument.

The top of the box should be carefully polished and the sides and bottom varnished. All the notes should be clearly marked before the instrument is used.

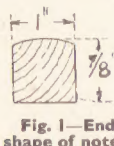


Fig. 1—End shape of notes

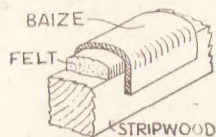


Fig. 4—The bearers

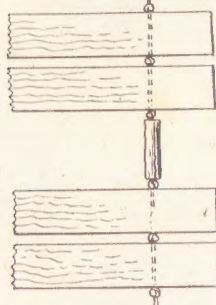


Fig. 3—Spacing between notes

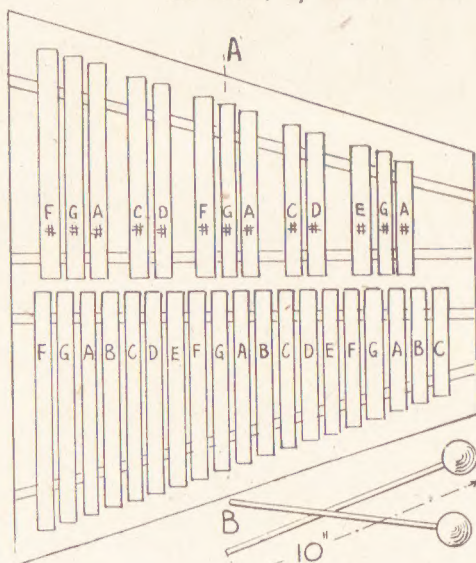


Fig. 2—Lay-out of notes and detail of beaters

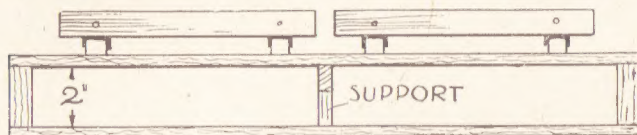


Fig. 5—Section through box showing support and note bearers

with the beater. A piano is good for tuning by if the instrument is to be tuned to concert pitch, but any instrument can be used for the same purpose—even a tuning fork.

Tune the naturals first, then the sharps. To sharpen the tone of a note, saw or plane a little of the wood off the ends. To flatten, if the note is just a little too sharp, turn it over and gouge a little out of the bottom lengthways. If a note is spoilt, it can be used for another higher up the scale.

table and mark the position of the holes, by which they are strung together, by pencil lines.

String the Notes

Start $1\frac{1}{2}$ ins. from the ends of the lowest note and finish 1 in. from the ends of the highest. Now bore the holes midway through the thickness of the notes, and use the pencil line on top as a guide for the correct rake or angle.

For stringing together, use whipcord and tie double knots between each note

screws. When a design is drawn out, the paper is placed between the piece of stripwood on top of a leaf of tracing paper, a leaf of carbon paper and a piece of drawing paper. The design is held perfectly still while being drawn and a duplicate is made at the same time.

Leaky Valves

If you should be stranded in the country, miles away from a garage or bicycle shop, through having a leaky valve, inflate the tyre and when it is hard, unscrew the pump, leaving the connection on the valve. Bend the connection and tie it with string as you would tie the nozzle of a football bladder. Before going on the road again, tie the connection to a spoke. This will

keep it out of harms way.

Fixing Knobs

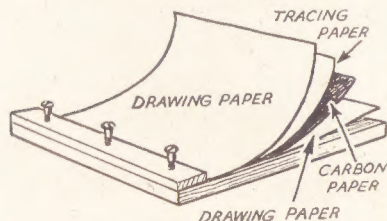
IN using a small wooden knob you may find glue will not hold it. If so, place



the knob in the hole and hammer a nail into the end. This is on the same principle as the wedge in the top of a hammer, but if nail is too long, cut it off. This holds a knob in position better than glue, and makes it permanent.

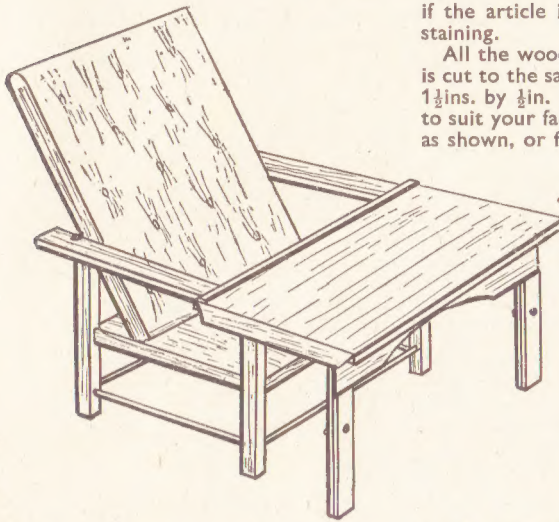
Saving Designs

WHEN a design is drawn by an amateur, the paper often becomes dirty, and when a fresh model is made the design has to be redrawn. The base



of the apparatus is 4-ply 10 ins. by 12 ins., and at one end of this base a piece of stripwood 1 in. by $\frac{1}{4}$ in. is secured by three

Fireside jobs can be undertaken comfortably on this EASY CHAIR WORKBENCH



if the article is finished by painting or staining.

All the wood for the legs and framing is cut to the same width and thickness— $1\frac{1}{2}$ ins. by $\frac{1}{2}$ in. You may make the joints to suit your fancy: they can be dowelled as shown, or for an easier job, a halved joint is quite effective.

A mortise and tenon joint would, of course, give a really first-class finish to the bench, besides making it nice and strong. If you decide on either of these last ones, some of the boards must be cut 3 ins. longer in order to produce the necessary joint.

Top Framework

Commence by making the bench top framework—two pieces 20 ins. long for the ends and three pieces 21 ins. long for the bars (or 24 ins. if lapped or mortise joint). The top which is thin plywood, say, about $\frac{3}{8}$ in. thick is cut to the width of the framework, but the length must be 1 in. more. This extra $\frac{1}{2}$ in. on each end will cover the guide bars fitted to keep the bench from sliding off the arms of the chair. They are 20 ins. long and have the ends tapered off, as shown in the side view.

All these parts can now be glued together, a few fine panel pins can, with advantage, be used to fix the ply top more securely.

Along the entire length of the top edge and opposite to the legs a narrow strip of wood is fixed to keep papers and books from sliding off when the board is tilted at an angle for reading purposes. This need not be more than $\frac{1}{4}$ in. thick and about $\frac{1}{2}$ in. wide.

Cut two pieces of wood 24 ins. long for the main part of the legs, and two more $19\frac{1}{2}$ ins. long to act as the extension pieces. A slot 9 ins. long and just over $\frac{1}{4}$ in. wide is cut in each of the main pieces, which should be ample for adjusting the height and slope of the bench top.

The top of the slot starts about 10 ins. down, and when both pieces are resting on the floor this is also the position for the hole in the shorter extension leg. A $\frac{1}{4}$ in. bolt and wing nut is used to hold the two pieces together and make adjustment easy. Put a fairly large washer over the head of the bolt before inserting it through the slot and hole.

Leg Fitting

Join the two legs with a bar at the top, making the width correspond with the top framework which in this case is 24 ins. A strip of thin plywood $4\frac{1}{2}$ ins. wide and shaped as in the sketch is added to the front of the legs in order to make these more rigid. It will also act as a stop for the extension legs.

A thin strip of wood or even plywood is fastened on to the inside edge of each extension leg. Its width of 1 in. allows it

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to overlap the other leg and keeps them both level and to slide easily when adjustments are made to height.

Two strong iron hinges can now be fitted, and it is essential these do not open or close too easily. It may be necessary gently to hammer the joints of these slightly in order to close them and make the working somewhat stiffer.

If the hinges worked too easily the table is liable to slip off the chair arms when in use.

Match Stain

After the wood has been glasspapered smooth and stained if necessary to match any existing furniture, the most satisfactory finish is, undoubtedly, french polish, but you may possibly have other ideas regarding this.

The measurements given are for an average size easy chair, but it may be necessary to make some slight adjustments to suit your own particular requirements. (276)

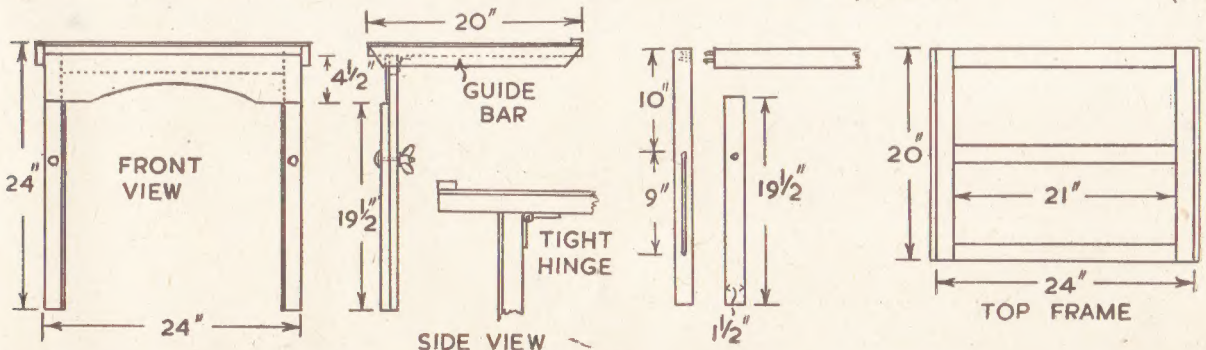
WITH the coming of the long winter evenings, our thoughts turn to the fireside and a nice comfortable easy chair. It is not wise to always be lolling about in an easy chair, but a little well-planned recreation can be most beneficial. There are quite a lot of really useful jobs that can be done when one is more or less taking it easy.

The use of a table is really a necessity for most jobs, but when sitting in an easy chair it is generally not at all possible to use an ordinary table with comfort. With the aid of the little attachment shown here a useful work bench or desk can be set up and brought into use very quickly.

Adjustable Legs

The two adjustable legs allow it to be used on any easy chair irrespective of height, and they also allow the top to be elevated at different angles. This makes it a most versatile bench, as it can be used flat, or for drawing and reading, it can be made to slope at quite a good angle.

The wood to be used should if possible match the chair on which the bench will be used. Oak or walnut are good for the purpose, although a softwood can be used



The handyman will find construction and repair in these WINTER GARDEN JOBS

IN these cold damp days there is little doing on the garden or allotment and the gardener may well feel inclined to rest on his laurels and enjoy the fruits of his labours until the next 'spring offensive'.

This is largely true, but there are always odd jobs to be done in the way of making new equipment and repairing old... jobs that might well be done now instead of leaving them until later when one might have one's hands full of work.

Potato Trays

For example, what about making seed-potato trays now? (Fig. 3). Well made, they will last a very long time. The actual size is not very critical. The writer made his 2ft. by 1ft. by 3ins. deep. The sides are nailed to four supports which project 3ins. upwards, thus enabling the trays to be stacked one on top of the other with enough space for light and air to get to the contents. Commercially, triangular section wood is used for the corner posts, but the amateur is not so likely to get this.

The cross bars are quite optional, but they form good handles for lifting. The boxes, if well made, are useful for storing other things besides seed potatoes.

Seed Boxes

Whilst on the subject of boxes, what about seed boxes with one removable end? The sketch (Fig. 3) shows the idea at a glance. When transplanting the seedlings, the end is removed and a small trowel can then be very easily inserted to remove the delicate plants without undue disturbance.

The seed boxes will last years longer if given treatment with special trade preparations such as can be obtained from chemists specialising in horticultural supplies. These are usually weird-sounding chemical solutions recommended by the Ministry of Agri-

culture or The Forestry Products Research team, and put out by private firms under trade names. Do not use creosote on the boxes.

A good supply of plant labels will be needed for the coming season and it pays, especially in greenhouse plants, to have really decent labels—not mere pencilled slips of wood that rapidly rot and become dirty and illegible. A very simple and inexpensive method is to write on the wooden slips with pencil (Fig. 8) and then dip them in a jar containing either spar varnish or shellac varnish (orange shellac dissolved in methylated spirit) (Fig. 7).

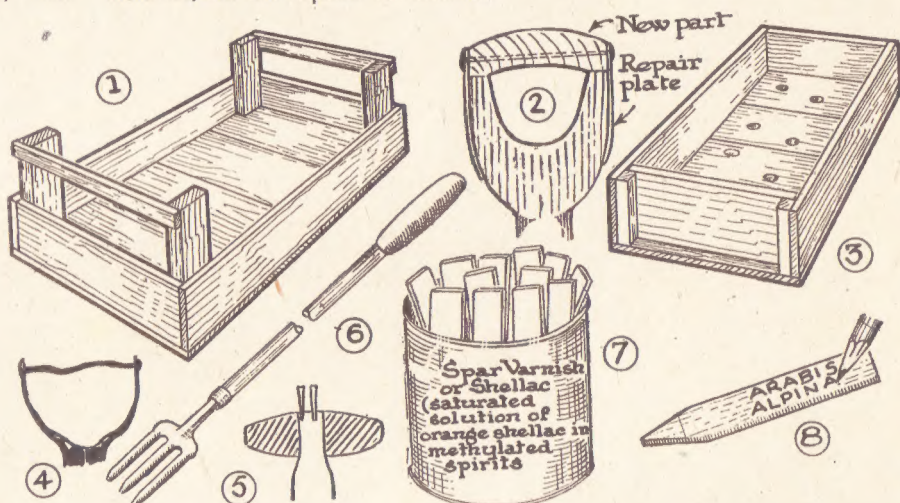
A much-needed job will probably be to repair handles of spades and forks. If they are in a very bad condition or have rotted right away at the base so that they have broken off, a new shaft is indicated, but this expense can often be

whittles down another end to take the cross piece again. One or two wooden or steel wedges will make a really tight job.

Handle Repairs

Some spades have a tubular cross-piece at the top which, after much hard use, often breaks out, leaving just a metal core across as at Fig. 4. The obvious remedy is to cut across this bar with a hacksaw so that it can be removed. A new wooden cross-piece is prepared, ash being a most suitable wood. Common deal is useless. A hole is drilled the full length and a new metal rod prepared. Before dismantling the old handle, take note of the simple arrangements of washers and riveted heads.

When the top of a solid wooden handle goes it is often possible to make a cross-bar on the principle of the one just



avoided. A slightly cracked shaft, for example, can be spliced and bound with suitable wire, the free end of the wire binding being secured to the shaft by means of a small staple driven in.

Some tools have a simple cross bar (as in Fig. 5) which eventually comes off. The remedy here is simple. One cuts away the damaged part of the shaft and

described. Repair plates may be used at the sides (Fig. 2). The spade handle seems obvious but (if well made) embodies the requirements made by many generations of spade users—a comfortable handle that will not unduly blister the hands with long use. Take care to ensure then, when repairing a handle, that the final job compares with the original.

Apart from repairing old tools, the simple tool shown in Fig. 6 may be made. This is simply a small hand-fork, minus its small handle, with a longer handle added (this is shown conventionally broken in the drawing for economy of drawing space) and a handle from, say, an old cycle handlebar grip added. Such a tool is very handy for grubbing around the bases of plants in places where a fork would be far too large. It saves a great deal of stooping.

These do not exhaust the list of possible jobs, but they are enough to keep you busy, always with the mind on the lighter warmer days. (308)

A Diary for the Photographer

READERS who follow our photographic feature will be interested to learn of the special Amateur Photographer Diary available now for 1951. Its reference pages contain, in compact form, all the essential information that the keen amateur photographer needs for his everyday work, including exposure tables for both daylight and artificial light. The reference pages include information on exposure, developers and development times, the hardening, fixing and washing of negatives, their intensification and reduction, and the making of prints on gaslight, bromide and self-toning papers. There are sections on enlarging, and toning, finishing and mounting prints. Other printing processes—carbon, Carbro, bromoil—and the making of slides, are also dealt with. Optical tables and formulae cover hyperfocal distance, depth of focus, supplementary lenses and projection data for still and cine projectors. There are also articles on colour photography, and specialised work like copying and air photography, as well as a number of smaller matters such as the use of an exposure meter. There is a section for recording exposures made, and the diary shows one week to each page. The diary is published by Iliffe and Sons Ltd., for 5/6 and obtainable at the usual booksellers.

Patterns on page 127 for this small desk PERPETUAL CALENDAR

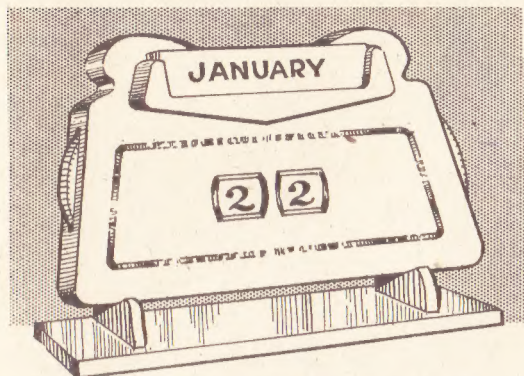


Fig. 1—The completed calendar in use

THE form of calendar shown in our illustration is very popular for standing on side table or mantel-shelf. It is quite compact and easily made from a few pieces of wood with the aid of the fretsaw.

The principle of the changing date figures can almost be seen from the illustration Fig. 1, but it is well, perhaps, to explain it in detail. There are two shaped pieces forming a front and a back, and between these two layers are three spacing pieces between which two discs turn, these discs bearing each a set of figures to make up the complete days of any month.

The discs protrude slightly beyond the edges of the front and back uprights to facilitate their movement with the forefinger as the dates alter from day to day.

The months of the year are contained on six cards and these rest compactly in a slotted frame at the top of the calendar. Thus, month and date are interchangeable, and the whole becomes a perpetual calendar and will last for all time.

In construction and assembly of the calendar, a word should be said regarding the wood to be used. This can all be $\frac{3}{8}$ in. thick with the exception, perhaps, of the cover piece or overlay which goes in front of the monthly cards; this can be $\frac{1}{2}$ in. or even $\frac{1}{4}$ in. thick.

The Base

Commence work upon the base, which is given in detail in Fig. 2 and needs, therefore, no further comment. Upon the base is glued and screwed two uprights, the outline of one is given on the pattern sheet included here. Talking of these diagrams the others included with it, may all be cut from one piece of wood, the several outlines being simply stuck down to the wood.

Turning again to the page of full-size patterns we next cut from it, or trace off, the outline of the front and back up-

rights. Note on the diagram some of the calendar cards are included. These must be cut round with the scissors and removed for future use.

Both front and back pieces are identical in outline, but in the front piece two 'windows' (C, Fig. 3) will be cut out; these allow the figures to be seen as the discs are turned. When the spacing pieces (A) and (B) are cut and their edges cleaned off they must be glued to the back upright in the positions shown by the dotted lines.

Now cut the two paper discs bearing the sets of figures from the page and stick them to $\frac{3}{8}$ in. wood and cut them round. Cut round also the circle (C) in the interior of each, being very careful to keep strictly to the line to form an exact and true circle. It is round these smaller discs that the larger ones revolve, so this is the reason for the above warning in cutting.

Glue the two discs (C) to the back

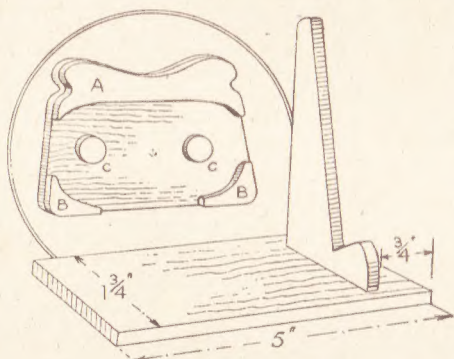


Fig. 2—Base and support piece

upright in their proper positions, these being got by pricking on to the wood from the pattern before the paper is glasspapered off. The whole back upright should now look like the circled diagram in Fig. 2. The edge of each numbered disc (the paper from these being not removed, of course), is next filed across at $\frac{1}{4}$ in. intervals with a vee file to form a grip for the fingers when turning them for altering the numbering.

Each disc may now require a slight rubbing down all over at the back to allow it to revolve freely—but not loosely, between the front and back uprights. Care must be taken when putting the figured discs over their respective centre discs, to keep that one bearing only the six figures on the left, and the larger number on the right. Thus when the forefingers draw the discs downwards in both cases, the

proper rotation of the figures is assured.

It only remains now to put a touch of glue on each of the spacing pieces (A) and (B) and lay on the front, being careful to get the exact position in relation to the back upright. Test the rotation of the figuring and their appearance through the 'windows' before the glue has set hard and make any minor adjustments which may be needed.

The slotted fitting for the monthly cards is easily made from the two parts (D) and (E) on the pattern sheet. Cut (E) from the $\frac{3}{8}$ in. wood and (D) from $\frac{1}{2}$ in. or $\frac{3}{4}$ in. stuff. Glue the two together and finally glue the whole to the top of the front upright. The edges of the completed upright should receive a final cleaning up with fine glasspaper before it is glued in place to the uprights on the base.

To make the monthly cards, cut out with scissors along the lines those given on the pattern sheet, each oblong being then 2 1/2 ins. long by 3/4 in. wide. Paste the remaining eight months to pieces of thin card (one each side) and put under weight until dry and flat.

The woodwork can be finished as desired, either stain and wax polished according to the class of wood used.

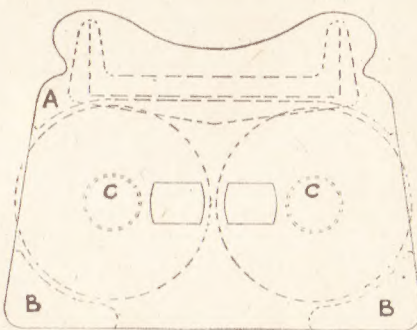


Fig. 3—Outline of back with windows

Paint, using matt colour in art shades would again make a very desirable finish.

If paint is adopted, then certain parts can be picked out in contrasting colours such as the edging of the top monthly frame and the edges of the back supports and the edges, too, of the base. A border or frame could be added in some suitable colouring, as shown, to fill the somewhat open space of the front.

Cleaning Wheels

WHEN cleaning an awkward article such as the wheels of bicycles or perambulators, an old tooth brush is very useful for cleaning in the small spaces satisfactorily.

How you can undertake the job of stuffing and MOUNTING A FISH

A SHORT while ago two articles dealt with the stuffing and mounting of birds; in this one it is proposed to show how fish may be similarly treated. Many fish have most attractive colouring and make beautiful cases, and as the bottom fishing season has not long begun, there is now an opportunity for obtaining excellent specimens.

They vary a great deal in size, according to the species, but the beginner is advised not to attempt a fish of less than about three-quarters of a pound in weight.

Skinning the Fish

The first step is to take notes of the colouring of the fish. This comes in useful at a later stage when it is necessary

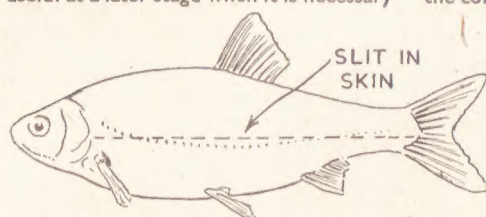


Fig. 1—Position of slit for skinning a fish

to touch up the completed specimen. After the colours have been noted, lay the fish on a piece of paper and sketch round the outline so that a copy of the natural size can be preserved.

Now lay the fish on a fresh piece of paper upon which the work of skinning is to be carried out. Slit it along one side from behind the gill to a point between the flanges of the tail. Working with a blunt knife and pair of scissors, commence to free the body from the skin, taking care not to rip or tear the latter.

Particular attention must be paid to the base of the fins, which will have to be severed with the scissors where they join the skin.

When most of the body has been freed, sever the spine as near to the base of the tail as possible. Next deal with the part at the base of the skull in the same way. Scrape the flesh away at this point, and make a small hole through

To Keep Brushes

TO keep paint brushes in a jam jar, first bore a narrow hole through the wooden handle, then push a piece of bicycle spoke through, rest it on top of the jar, so that the bristles do not touch the bottom. This will keep them in shape and usable.

which it is possible to remove the brains. Cut out the tongue, and scrape the inside of the mouth and remove the eye-balls.

It is most important that all the flesh should be removed from the whole of the head area. If this is not done, and any is left behind, when it dries, the skin will shrink and give the head a warped appearance. Wash the skin well in fresh water, dry with a piece of cloth, and paint it with arsenical paste (see Fig. 1).

Preparing the Body

The artificial body is now prepared. Sand is normally used in this operation, as when the skin has been successfully stuffed, the 'give' of the sand enables it to be gently massaged to its correct form.

First cut a piece of cork which will form the core of the body. It should be flattish and roughly rectangular, and the size will vary according to the size of the fish.

One wire, about size 12, pierces this cork lengthways; and two others pierce it at right angles to the flattened side, and may be wound round the cork once to make them secure. The first wire must be cut to the length of the fish; and the other two, which are used to mount the fish to the board against which it will be set, should be cut off to about 5ins. in length (see Fig. 2).

Stuffing the Skin

Lay the skin on a piece of clean paper, and insert the artificial body, gently easing the long wire into the tail and head. The other two wires should now be sticking upwards at right angles to the side of the fish. Fill the skin with sand, packing it tightly and approximating it to the normal shape of the skin.

When this is completed, sew up the slit with strong thread and neat stitches, leaving the two wires projecting. After the sewing is complete, compare the shape of the fish with the sketch: any additional sand which may be needed to fill it out can be inserted through a gill slit and eased to the required place. Pat the skin to the exact shape.

Put a little putty at the eye sockets, and insert artificial eyes. These are of plain uncoloured glass, with a black pupil.

Wash the fish under a running tap to remove all traces of sand, and dry off with a clean cloth. Cut pieces of white paper and pin these over the fins to keep them in their proper position while they dry. The dorsal fin should not be raised to its full height, but rather about half of this.

Take care not to pierce the fins with the pins. The skin may now be given a fine coating of clear gum. This helps to

set the scales. The specimen can now be put aside to dry, and this takes about three weeks.

Touching Up the Completed Fish

When the fish is dry it will be found that almost all the natural colours have faded. This is when the notes of the colouring become most useful.

Artists' oil colours should be used, and a variety of greens, browns, whites, and black will be needed. Other useful colours are chrome yellow, vermilion, and burnt sienna. In the case of perch, the bars must be carefully shaded into place again, and the spots of trout and salmon would need special attention.

Fish of one colour are, perhaps, the hardest to touch up, because of the gentle shading which is needed. A yellowish green shading will be needed for the upper part of the belly. Thin the oil paints with a little turpentine before use. Lastly, when the colours are dry, give the skin a coat of white varnish, thinly applied.

Mounting the Specimen

When in position in its case the fish should have about double the space above and below it, as it has at either end. If there are 3ins. between the head and tail and the end of the case, there should be 6ins. above and below, from the dorsal fin and the bottom of the belly.

The case should be of plain board of thickness in keeping with the size of the fish. The two mounting wires are passed through the back of the case and clenched to secure, and the fish should stand out a little from the back itself.

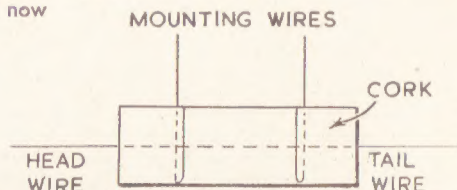


Fig. 2—Looking down on the artificial body with wires

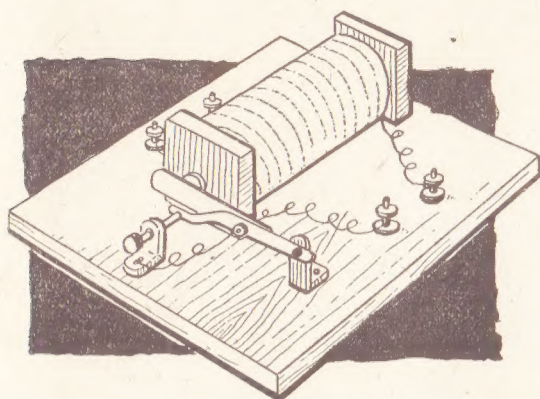
Decorate the bottom of the case with sand and pebbles, glued into position. Reeds, dried so they are stiff, can be glued at the back of the case, and shorter stems and a little grass may be used for the front part.

A little lichen, such as grows on pebbles, can be glued to one or two of the stones. The stones can be given a touch of white varnish to effect a slight gloss. Nothing but aquatic objects should be used for the decoration of the case.

A sliding glass front, riding in grooves at the sides, is useful, as this can be removed at any later time when it is desired to touch up any colours which may have faded. The outside of the case may be varnished or painted as desired.

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The amateur electrician can easily construct a MODEL SHOCKING COIL



THIS shocking coil works from a small dry battery, stepping up the voltage so that a strong (but harmless) shock is obtained. The amusement such a coil can provide is well known. Persons may see who can endure the strongest shock, or hold hands in a ring. The shock is obtained from two metal handles and by putting one in a vessel of water and holding the other it is possible to see who has the strongest will-power and can pick up a coin or other object out of the water.

As the current output is very small the coil is not dangerous, but shocks should not be given to anyone without their previous knowledge (such as by connecting the coil to the door-knob), as they will be too startled.

How the Coil Works

The circuit is shown in Fig. 1, and this serves as an aid to explanation. A battery of, say, 3 to 6 volts is connected to the primary 'P' via the contact and trembler. The current magnetises the core of the coil, which attracts the trembler, resulting in the circuit being broken. The trembler then springs back against the contact, and the procedure is repeated at high speed, resulting in a buzzing noise.

These interruptions of current allow the coil to function in the same way as a transformer, and as the secondary 'S' has a great many more turns of wire than the primary, the voltage output at the handles is alternating and many times the voltage of the battery.

By changing the voltage of the battery and adjusting the speed with which the armature vibrates, the strength of the shock can be adjusted. The number of turns on primary and secondary also governs the strength of the shocks, but is not in any way critical.

Making the Parts

The individual parts are illustrated in Fig. 3 and can be made up from almost any oddments. The bobbin on which the coil is wound is shown at 'A'. The

centre piece must be of iron or similar magnetic material.

Its size is not critical but something about $\frac{1}{4}$ in. in diameter is most suitable, and a length of an iron bolt or large nail can be used. It does not matter whether the material is round, square, threaded or plain. Ten or twelve lengths of iron wire bundled together can be used provided all the ends are flat at the trembler end.

Two cheeks are cut from thin wood, as shown, and have a hole so that they can be pushed on each end of the core, leaving a short piece projecting. Before winding the coil (as described later) bind a strip of stout paper round the iron to act as insulation.

The armature 'B' can be cut from a double thickness of tin ('tin' containers are really tinned iron). A single, thick-

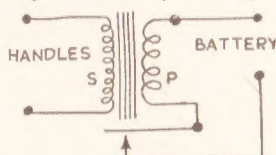


Fig. 1—The electrical circuit

ness of the same material or a thin piece of brass is used for the springy contact strip and these two are fixed together with a small bolt (see Fig. 2). This strip is shown at 'C'.

Tin can also be used to make the bracket 'D' and the hole through which the contact screw passes is level with the coil core. A small bolt with two nuts forms the contact screw.

Winding the Coil

For the primary, wind on two or three layers of wire of about 22 to 24 S.W.G. Cotton or enamel covered wire can be used. Leave the ends projecting through tiny holes drilled in the ends of the bobbin.

A strip of strong paper should now be wound round on top of the primary winding and tied with cotton. Keep the

edges of this paper right up against the insides of the bobbin ends. The secondary is wound on top of this paper. About 20zs. of 42 S.W.G. single silk covered wire is most convenient, and there is no need to count the number of turns. Winding of the secondary will be speeded up if one end of the iron core is gripped in a geared drill so that the wire is wound on as the handle is turned.

Fixing Coil

When the coil is finished put on a further layer of paper to protect the winding and fix the bobbin to the baseboard. Here, glue can be used, or small screws driven up from the underside.

The positions of the parts will be seen from Fig. 2. The completed armature is mounted on a second small bracket, as shown. A space of about $\frac{1}{16}$ in. is left between the armature and end of the coil pole. The contact screw bracket is now fixed and the screw adjusted until it bears quite firmly on the springy strip. For battery and handle connections, terminals or wood-screws can be used. The thick primary is connected to battery and trembler bracket. The thin secondary to the handles. A lead goes from the contact screw bracket to the battery (see Fig. 2).

Adjusting the Coil

For the handles, any metal objects can be used. Connections should be made to them with lengths of insulated flex taken from the screws at which the secondary terminates, as shown.

The armature will buzz in lively fashion, and by adjusting the strength with which it bears back against the contact screw, and the space between armature and coil pole ending, the strength of this buzz (and consequently the shock) can be varied. A strong new battery will also give a stronger shock than a smaller battery. However, it is unlikely anyone will be found who can endure the full power of the coil and a quiet buzz from the smallest type of dry battery will be enough for many people.

In the unlikely event of no shocks being obtained, the fault will almost always be found in the secondary or its connections. Care should be taken not to break the thin wire when winding it on.

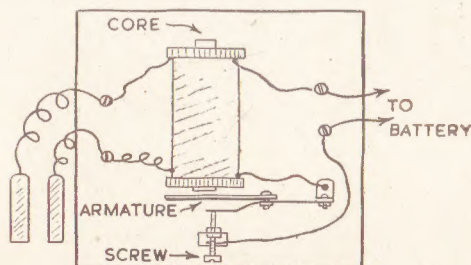


Fig. 2—Plan view showing layout

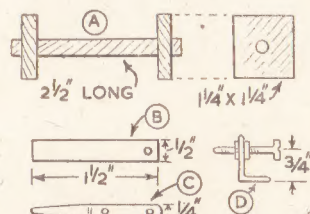


Fig. 3—How to fashion the parts

You get better work if you follow these hints on TOOL SHARPENING

THE woodworker should always insist on having first-class cutting edges on his tools. Blunt edges on chisels, planes, scrapers, etc., lead to bad workmanship, and take much of the pleasure from the craft. It is a fact that a blunt chisel can be more dangerous in use than a sharp one.

Invest in a good oilstone, and look after it. There are many varieties from which to choose. A rough stone is useful for quickly renewing a badly worn edge, but a smooth stone is essential for producing a fine edge, so, although many woodworkers manage with one fairly smooth stone, it is an advantage to have two, or one of the oilstones which have a rough surface on one side and a smooth surface on the other.

During use, keep the stone well

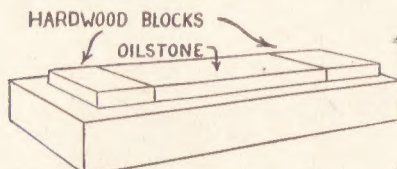


Fig. 1—An oilstone hint

lubricated with a thin machine oil, or neat's-foot oil. This causes the particles of metal and stone to float away, and so prevents the pores of the oilstone from becoming clogged up. After use wipe the surface of the stone clean, and store carefully. Should the surface become dirty or glazed, clean it with a rag soaked in paraffin.

Use of Stones

Stones are fragile; do not use yours as a door-stop, or as a hammer. The best way to keep it safe from dirt and damage is to make a box for it, complete with lid. A useful tip when making the box is to insert two hardwood blocks, end grain up, level with the surface of the stone, as shown in Fig. 1. This increases the effective length of the stone. Make the stone fit snugly in the base of the box, but it should be removable so that both faces can be used, and also the edges when necessary.

Should the surface of the stone become hollow through frequent use, rub it face down on a flat piece of sandstone, using water as a lubricant. Another method is to use a sheet of emery cloth tacked onto a piece of board. Try to prevent the stone from acquiring a hollow surface by using the whole area of the stone, not just the centre.

Here are some hints on sharpening chisels and plane irons; both tools require the same treatment. Examine the business end of a chisel and you will notice two bevels, as in Fig. 2. The small one is the sharpening bevel, the longer one the grinding bevel.

When sharpening on the oilstone,

place the smaller bevel flat on the surface, so the tool will be at an angle of 35 degrees (Fig. 3). Using a firm pressure, move the tool along the stone, taking care not to vary the tilt, otherwise a curved surface will result. Keep the body still, only using the arms. There is a certain amount of knack in this operation, which some people acquire only with difficulty.

Backing Off

About a dozen strokes should suffice to restore the edge of a fairly sharp chisel. The sharpening is not complete yet, however, as a burr forms on the back of the tool, which must be removed by 'backing off'. To do this, place the back of the tool perfectly flat on the oilstone, and rub with a circular motion. The wire edge will then be left on the stone. Test the edge of the tool with

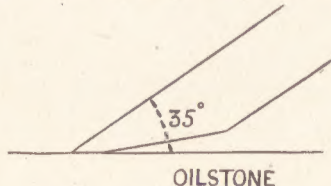


Fig. 3—The sharpening angle

the fingers to ensure that the removal of the burr is complete.

After sharpening, an even keener edge can be obtained by stropping the tool on a strip of leather coated with tallow and fine emery powder.

Careless backing off will eventually produce a bevel on the back of the tool. If this happens, or if the tool has been allowed to get into a bad condition, you should re-grind it. For this you need a grindstone. Small hand grindstones can be obtained at reasonable prices, but when using any grindstone, be sure to keep the stone well moistened with water, otherwise the heat produced will destroy the temper of the metal.

Hold the tool at an angle of 25 degrees, so the grinding bevel is flat on the surface of the stone. After grinding, renew the sharpening bevel on the oilstone.

Paring gouges—curved chisels having the bevel on the inside of the curve—are sharpened by means of specially shaped pieces of stone known as oilstone slips. It is best to buy the correct size of slip when you obtain the gouge. For backing off, use an oilstone in the ordinary manner.

Firmer gouges—those having the bevel on the outside—can be sharpened

in the same way as flat chisels, except that they must be rolled so as to produce a smooth curve. Backing off requires the use of an oilstone slip.

To check whether a cutting edge requires sharpening, hold the tool up to the light, and look at the edge. An edge needing renewal will reflect the light so that a thin white line is visible. A sharp edge reflects no light.

A scraper is a flat piece of hard steel used for smoothing wood prior to glass-papering. If the edge is badly worn, remove it by filing. Then make the edge perfectly smooth and flat by rubbing it on an oilstone. The scraper is now ready to have the burrs replaced.

The object of this is to turn over the edges of the metal so as to form the shape shown in Fig. 4. This can be done with the back of a gouge, or any suitable rod of hardened metal. Hold the scraper firmly against the bench, and draw the gouge up the full length of the scraper, using a good pressure. Repeat this four times.

For subsequent sharpening you need not file down the edge of the scraper. Simply remove the old burrs by laying the scraper flat and drawing the back of the gouge along them. Then put on the new burrs as already described.

Centre Bits

Centre bits can be kept in good condition by using a half-round file. The cutting edge and the spur need attention



Fig. 2—Two bevels

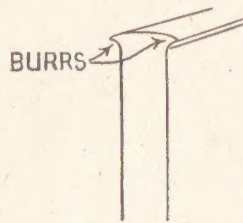


Fig. 4—Scraper cutting edge (magnified)

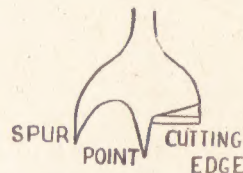


Fig. 5—The centre bit

(Fig. 5). On both these parts use the file very lightly, removing as little metal as possible. File the spur on the inside only. Notice, too, that the spur must project lower than the level of the cutting edge; filing too much metal away might ruin the bit.

Twist drills are tricky to sharpen, requiring careful work with small files. Sharpen the spurs on the inside, removing only a little of the metal.

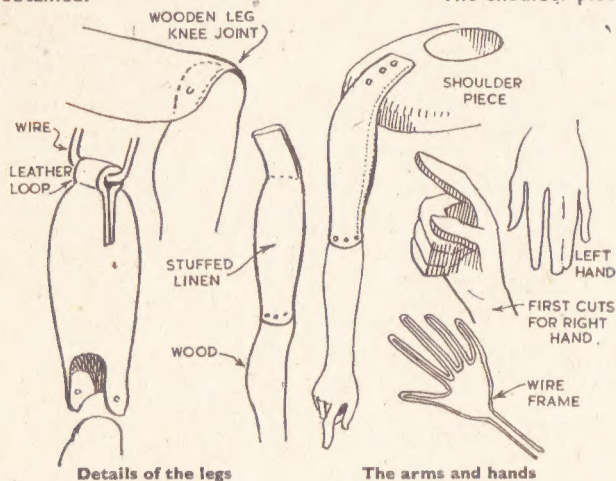
A word about saws. Although it is possible for the amateur to sharpen his own saw, it can turn out to be false economy. It is much better to leave saw sharpening to the expert, and to delay the time when the saw will need attention by using it carefully. Attempting to saw through nails does the teeth of the saw no good.

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The second and final article on how to make A VENTRILOQUIST'S DOLL

In the former article we dealt with the methods of making the head and face with controls. Having completed that portion we can finish it with the necessary make-up.

Some artists make-up their puppets with actor's grease paints before each show; but, for the ordinary showman the head and face can be painted with 'flat' oil colours. Using cream or white 'undercoating' as a basis, and tubes of student's oil colours for tinting the cheeks, lips, and eye shading, a very good finish to the papier mâché head may be obtained.



Details of the legs

The arms and hands

Before painting it is a good plan to give the head a light coating with 'Alabastine', made up into a creamy paste and painted on with a stiff brush. When this coating is dry it should be rubbed down well with glasspaper to make a smooth surface for the paint. Several coats of undercoating should be put on, and sand-papered before the final painting is done.

Painting Effects

One of the advantages of a well painted head is that it can be kept clean and freshened up with a slightly damp cloth or sponge.

One rather unpleasant fault with a lot of puppet makers is that they overpaint their faces, giving them scarlet cheeks and noses and other violent colourings. The puppet should be well coloured, otherwise it will 'pale' before the stage lighting, but the rosy lips and cheeks may still give a true effect without being deep scarlet. Vermilion tint is a very useful colour for this purpose but even this should be handled very carefully. Avoid blackish-grey tints for the eye shadows; pale Prussian or Antwerp blue, mixed with cream, make a much cleaner looking shadow.

The body of the puppet is a hollow framework. It is usually made of wood

and papier mâché and has an opening in the back for the hand of the operator to control the head.

In order to keep the figure rigid when seated the lower or waist section of the body is made of a heavy solid block of wood, known as the seating block. This block has a perfectly flat surface at the waist, and on this surface rests a much smaller circular block. This second block (it is really a disc about 1in. thick) is not fixed, it can be removed. When the head is in position the rounded base of the stump rests and rotates on the disc.

The shoulder-piece with the hole for the neck is held in position by means of wooden side supports fixed firmly to it, and to the seating block. The head or its stump, is let down through the neck-hole on to the waist block.

Some of the ventriloquist's dolls have a wooden frame-body but instead of a papier mâché outer form, the rounding out of the body is made by a padded covering, usually

of cloth; over this shape the puppet wears its actual clothing.

The majority of these puppets are made to the height and proportions of a child but full life-size adult figures are also used by many expert showmen. Animals and birds have also appeared in ventriloquial acts.

The Limbs

Some exponents of the art have dummies which they can make to 'walk' about the stage. In many cases this action is very well done, but in many other acts the walking is a stiff, jerky piece of manoeuvring, obviously mechanical in appearance, and detracts from, rather than adds to the realism of the figure. In any case, the walking action calls for a very elaborate system of 'works'. But for general amateur use, there is no real necessity for the doll to walk at all.

The legs of the puppet can be, like the legs of a marionette, entirely of wood, or they can consist of wooden lower limbs and feet, with the upper halves, knee to hips of padded or stuffed linen.

The latter method is easy and quick to make but, at the same time, a pair of well shaped and neatly made wooden legs, with good knee joints would give much better form to the figure than the stuffed thigh. What is more important,

the all-wooden legs would give the figure more poise and rigidity when standing up. The knee-joint should be made to work very freely, so that when the knee is lifted, the lower half drops easily.

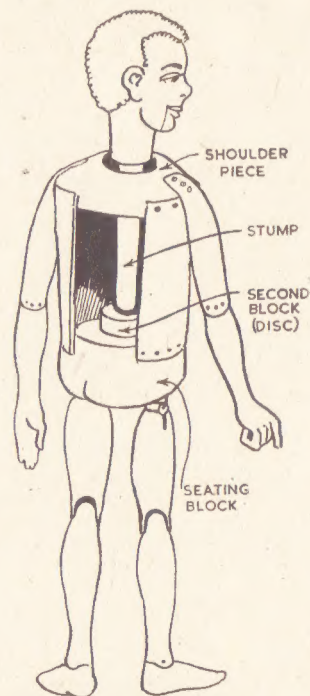
The feet can be fixed to the ankles or joined with a tongue and groove. They are generally finished off with a pair of child's shoes. As a matter of fact children's clothing can be used for the complete dress of the puppet, unless, of course, some specially designed costume is required for the character, such as a particular kind of period dress.

Very thick and stiff material should be avoided especially for jackets, as it interferes with any movements of the limbs it may be necessary to make.

The legs can be joined to the thighs—the seating block—by means of leather loops inserted in the tops of the thighs of the all-wooden legs. To hold these loops, wire staples, with long ends can be fixed, upwards, in the seating block. If the padded linen thigh sections are used these can be fixed to the base of the block with long carpet tacks.

The Arms and Hands

These may be made in a similar manner to the legs. The lower half, including the hand, is made in one piece and is carved, usually, in wood. The



The completed puppet

upper half, elbow to shoulder may also be a stuffed linen tube after the style of the thigh joint already mentioned. The

arms can be joined to the shoulders with carpet tacks like the stuffed thigh joint.

The hands are best when carved in wood. In size they should be smaller than the puppet's face, although the normal length of the human hand is about equal to the distance between the hairline and the chin.

Wire Frames

For those who feel that they are not capable of carving their hands, there is always the method of making a wire finger frame—like a miniature glove stretcher—binding the palm and fingers with this tape, bending this wire skeleton into the particular position required, and finishing off the actual modelling with plastic wood. The wire of this frame hand should be left long at the wrist for fixing it to the wooden forearm.

The ventriloquist's doll does not make great play with its hands. As a rule the face and character of the figure are its principal attraction. At the same time certain attitudes will occur in which the puppet's hands will be seen by the audience, and for that reason they should be made clean in appearance and graceful in shape.

Finger Manipulation

A beckoning hand, one finger raised, is a useful form for a right-hand, and if the rest of the fingers can be turned in to hold articles, a bunch of flowers, for example, the hand can be used at times to draw the attention of the audience away

from the operator—the puppet master.

This business of controlling attention and directing it away from the face and lips of the ventriloquist is a very important part of the art, and one which depends a lot on the personality and activities of the dummy. The audience will judge the direction of a sound partly through their sense of sight. When the ventriloquist opens the mouth of his puppet the audience will assume that the sounds which the showman is making come from the mouth of the dummy. They know this is not true but they like to believe it is so.

So it follows that the more active the figure is, the less important will the operator become and that is just what the showman really wants to happen. A turn of the puppet's head, a movement of the eyes; everything is of the greatest value to the manipulator and a good showman will seize on these things and make much of them.

Rehearsals

It follows that much careful rehearsal will be necessary before the beginner can put on an act before a strange audience. By rehearsal is meant the handling and manipulation of the puppet to synchronise with the voice and gestures of the showman. Every movement in the act will need to be done over and over again until it is time and action perfect. A good plan is to rehearse in front of a mirror, then the showman can see his act as others,

perhaps, will see it.

So much for the ventriloquist and his doll. Of course, ingenious craftsmen will devise new tricks of movement or fresh mannerisms for his mouthpiece. He may try his hand at running a dialogue with two figures, one on either side. In this case the stringing of the facial movements will have to be set for right or left-hand.

Working Two Puppets

Two puppets will also mean the cultivation of two separate voices apart from the speaker's normal speech and a good deal of rehearsal of the vocal changes will be necessary. This multiple voicing is done extremely well by some of the modern ventriloquists, and it enables them to give wider scope and more variety to their acts.

To manipulate two puppets simultaneously will require even more rehearsals than that of a single doll before the act can take the stage, but with slight, but carefully arranged, pauses in the dialogue, the operator will get opportunities to concentrate on the puppet next to speak before going into his change of voice.

The illustrations accompanying this series must be regarded as guides rather than as the exact details of a blue-print. So that, while they give reliable information on the points in question, the actual scale and dimensions of the doll and its parts are left to the judgment and requirements of its maker and showman.

From The Editor's Notebook—

OUR recent series of articles on woodturning brought a letter from Mr. C. Robinson of Hebden Bridge, Yorks., telling me he still uses the Hobbies Companion Lathe he had over 40 years ago, and the handframe bought 50 years ago. Some good things almost last forever, you know!

WHEN you send in a postal order in reply to some of our interesting advertisements, what do you do? I ask because some of the advertisers have written me that readers are signing them at the bottom, and so causing considerable trouble. When this is done the Post Office will not cash them and so they have to be returned to the sender with an explanation and request for alteration. A postal order should have entered on it the name of the person or firm to which it is being sent, and just crossed 'and Co.' as a safeguard.

MAKING model galleons is a most popular hobby now, but not many readers are able to complete them inside an electric torch bulb. It can be done, however, for Mr. J. Dobson of Plymouth has succeeded, to the amazement and admiration of all who have seen

the result. He first had to get the bulb away from the metal holder and this was done only after half-a-dozen failures. Moulding the Plasticine sea inside was done with a pin, whilst human hair was used for the shrouds and ratlines. The sails, of paper, were inserted horizontally and then raised into position, the manoeuvring being done with a needle and 5 amp fuse wire.

I STILL hear occasionally of would-be readers who find difficulty in obtaining *Hobbies Weekly*. Of course, it is not always possible to stroll into a newsagent's shop, or stop at a bookstall to pick up a copy, but you can have a copy ordered for you for regular delivery. It is no use leaving it to a casual 'pick-up', because something you may want very badly is almost sure to be in the copy you missed. So by ordering a copy from your usual supplier, you can be sure of not missing a single copy.

AN Index to our volumes is always a useful thing to have as a means of reference for something you want to make and which has appeared in a forgotten issue. The index tells you where you can find just what you want to know. Or if you are undecided what to

do next, the Index will suggest a wide range of subjects from which you can choose. By the way, our Volumes are for six months, commencing with the first issue in April and the first issue in October. The actual number of the issue and the volume are always given on the first page, every week. The Index, No. 110, for six months up to the end of last Sept. is now available for 1/- post free.

THE Nottingham Rotary Club are already planning for a Hobbies Exhibition to be held at the Cottesmore Schools during Easter week next year, and readers in the district should make a point of sending something in. There will be fuller announcements about it later on.

READERS have shown great interest in our feature of The Ship Modeller's Corner, and already our expert 'Whipstaff' is being bombarded with all kinds of queries of reader's individual problems. Nothing has so far been beyond his ability to deal with, and all prove of much interest. Notes on the various matters will appear in these pages and, no doubt, be of great assistance to all the other enthusiasts.

The Editor

The second of our articles for the amateur on SILK SCREEN PRINTING

IN this, our second article on silk screen printing, we discuss how to produce colour printing at home, with the equipment as already described. Now we can deal with making the stencil and printing the job.

Having completed the making of the necessary equipment described in the first article, the amateur silk screen printer must now decide on a suitable design to reproduce. For the first experiment it will be best to choose some design which is not too elaborate and which can be printed in two, or at the most, three colours.

In this article we shall explain first how

as a knowledge of photography and unless the would-be screen printer is also a photographer, he would hardly be able to undertake them in his own home. Therefore, we shall confine ourselves to considering the other two methods in this article.

'Filler' Stencils

First, let us consider the 'filler' type stencil. When using 'filler' stencils the design to be printed should be drawn full size on a sheet of stout paper or flat card and placed on the base board of the printing table. Then the screen (which you will remember consisted of organdie, taffeta silk or bolting silk stretched

required are blocked out with 'filler', which is painted on with a brush. To avoid pin holes, it is usually best to apply two coats.

There are many suitable screen fillers and the chief requirements of a good one are that it shall not be affected by the colour printed—be it oil paint or cellulose—and that it can be removed from the screen afterwards, leaving all the fine mesh clean and open.

Using Oil Paint

For oil and oil-bound paints—which are suitable for the beginner—a good 'filler' may be made of liquid glue, with poster or showcard white to give body and a little glycerine. The last is to keep the mixture flexible while it is being applied. On very wet damp days, the introduction of a little acetone will assist speedy drying of the stencil. Such a 'filler' will not be affected by oil colours and may be removed with warm water when it is no longer required.

Cellulose acetate is another 'filler' which may be used with oil colours. It is not affected by certain nitrate solvents and thinners which may be used in some of the colours but it may be removed easily with standard cellulose solvents. Of course, it cannot be used if the job is to be printed in cellulose.

Knife Cut Stencils

In the case of the second type of stencil mentioned, i.e., the ones cut with a knife by hand, there are two materials which can be used by the home handyman screen printer. The cheapest is tracing paper. This is placed over the full size design which should be 'in register', i.e., in the registration marks on the baseboard, as already described. It is cut with a knife which must be very sharp. While a penknife would do, it is far better to invest in a proper stencil-cutting knife, which is inexpensive and may be obtained from any silk screen



to make the stencils, then discuss the materials with which to print the job, and finally, the actual printing procedure will be described. Let us deal with a two colour job; for in more complicated work the directions given for the printing of the second colour will also apply to all colours to be done subsequently, irrespective of their number.

Three Types

There are three main methods of making stencils. There is (1) the 'filler' type stencils, in which the parts of the design where no printing is required are blocked out by painting on the screen with a substance which is not affected by the colour used, but which, of course, can be removed after the job is done, so that the same screen may be used again; (2) knife-cut stencils, which are made either of paper or proform (described hereafter) and which, as their name implies, are cut by hand; and (3) photographic stencils which are used by the professional screen printer to reproduce designs which are either too fine to be cut by hand or painted on to the screen with 'filler', or are half-tone reproductions of photographs or wash drawings, etc.

To make photo-stencils, some fairly elaborate equipment is required, as well

tightly across a frame hinged to the base board) is lowered so it rests on top of the design which will show through the mesh of the material used.

The design can then be traced on to the actual screen either with a dark pencil or with ink applied with a brush. Next the screen is raised but before the original design is removed, care must be taken to mark its exact position on the base by fixing suitable registration guides to the baseboard. These are placed along the bottom and left hand edges, as illustrated in the first article.

Then the portions marked on the actual screen where no printing is



(1) Screen raised, with stencil mounted, and job in register on baseboard. (2) Screen lowered and squeegee ready to draw across the screen to force colour through mesh. (3) The finished print in one colour

printing supply firm. A sign writer's foil-cutting knife will do equally as well and is cheap to buy.

As the stencil is cut, obviously all the unattached portions of the design, such as the centres of the letter 'O' for instance, will become loose, as they are cut from the main portion of the paper stencil. They should be kept carefully and if there are many of them, they may be numbered and given a key on the art work below to assist recognition.

Fixing the Stencil

When the stencil is completely cut, it should be placed over the sketch (still in register on the baseboard) and small dabs of glue should be applied to it at convenient places. The screen, which has been stretched across the frame which is hinged to the baseboard should be lowered on to the paper stencil with its 'glue dabs' waiting to receive it. Thus the main portion of the paper stencil is attached to the underside of the screen

by the blobs of glue.

After this, all the smaller unattached stencil portions must be fixed carefully in place, taking great care to keep them in register by referring to the original sketch which is still on the baseboard in the 'register' guides.

Register Essential

This question of register is important, for it is the means of printing the second (and any other) colour in the correct position in relation to the first colour printed. Thus the job to be printed should be the same size as the card or paper on which the original sketch is made. For when actual printing begins, this sketch will be removed from the baseboard and the 'job' inserted instead. Accurate registration is ensured by always returning the partly printed job to exactly the same position on the base, i.e., to the register guides along the bottom and left hand side.

When preparing the stencil, whether

it be of the 'filler' or cut type, always remember that the printed job must go through the actual printing process for as many times as it has colours to be printed. A two-colour job will be printed twice and each time it will be placed on the baseboard in the same position by means of the register guides provided.

For Each Colour

Therefore, it is clear that there must be a separate stencil for each colour and that each stencil must be prepared so that it only permits one colour to be printed. Thus, the first stencil will 'leave open' only the portions of the design to be printed in the first colour, although in many cases where two colours meet, it is sometimes a good plan to leave a slight 'overlap' which will be covered when the next colour is printed. Practical experience will best teach when this should be done.

(To be Concluded)

The home handyman has a choice of making DRAINING RACKS

THERE is one place where we can always make some improvement and that is in the kitchen. So much work here is real hard work and just for the sake of a little planning our lot could be improved. Many people with a low sink spend far too much time bending down to wash up.

Build up a unit (see Fig. 1) to raise the washing-up bowl and also prevent the usual scratching of the sink base and its accompanying grease. Side pieces should be about 4ins. high and 9ins. long, and note the cut-outs to allow water to swirl freely underneath. Four or six $\frac{1}{2}$ in. dowel rods can then be fixed through to a width of 15ins., according to the size of sink.

Many houses have a draining board which is a constant danger because of slipping. Here is a better idea, and you can even take it outside in the air and let the goods dry. It is made with two lengths of $1\frac{1}{2}$ ins. by 1in. wood and 24ins. long. Round off the edges a little and secure with two cross pieces.

The rest (see Fig. 2) is made with $\frac{1}{2}$ in. dowel rods about 7ins. long and fitted into intervals of 1in. Soup plates will need at least 2ins., but this you may adjust to your own idea. Have four for soup plates and the rest for the ordinary plates.

The following suggestion can only be used if you have the space but it would be a good plan to measure up the space available and get out a little sketch. Read this article first and picture out

what you can do with the material you can get. The main idea is to give a comprehensive draining board for as many of those things which do not get in the ordinary rack (see Fig. 3).

The base would be a 6in. shelf over the sink and along over the taps. Next, take up two uprights in 1in. wood to a height of 24ins. Many sinks have a window over them and in this case you would remove the fitment to one side.

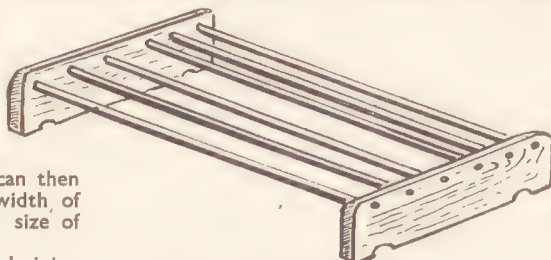


Fig. 1—A simple draining rack of dowel and end stands

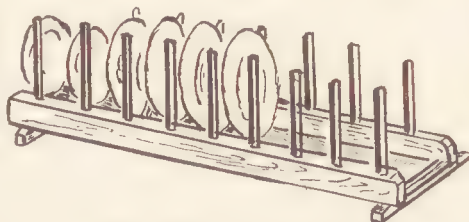


Fig. 2—With upright dowel posts and raised rack

Across the top fit your main section as shown. Measure down and also take the largest dish or plate so you do not waste space, allowing 2ins. for clearance.

A sloping board with slots, as shown, is now fixed right across and is tilted inwards a little (note the bent bracket). This shelf can be about 4ins. and slides

inside the fitment by 2ins., leaving a gap of 4ins. for the draining. The plates are then secure and held by bars running down the back on a batten across the top.

Below you should now have a space. According to what you usually wash up fix the dowel rods across to hold cups in one section and above prepare it for dishes and bowls.

Considerable time can be saved in a small kitchen if you use the racks for the

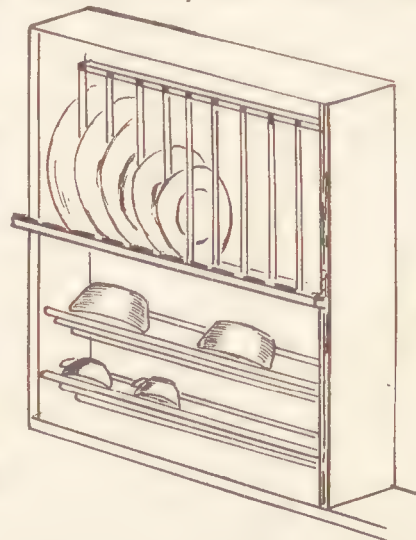


Fig. 3—Two types of rack in a wall cabinet

draining goods and also the one suggested in the first part of the article for the dirty 'corks'.

Space permitting, other racks can be put up in odd places around the sink for we all know that in these matters you cannot have too many, especially when we have company. (228)

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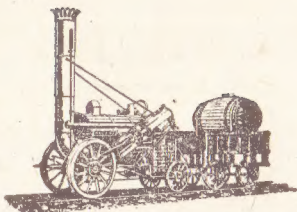
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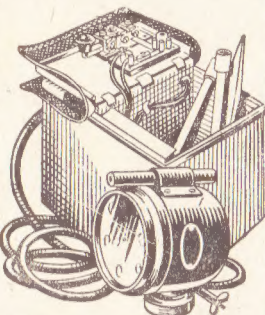
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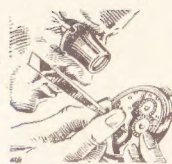
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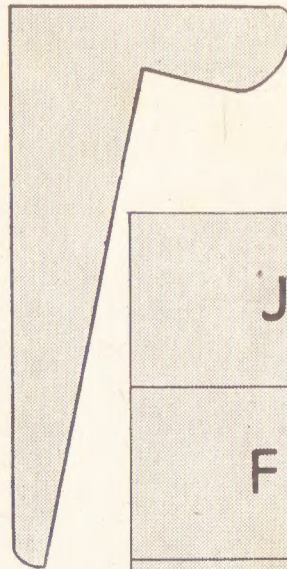
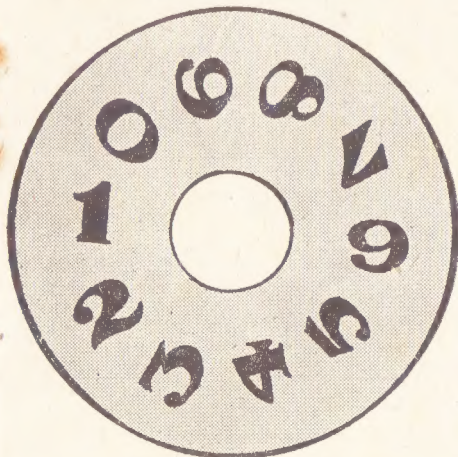
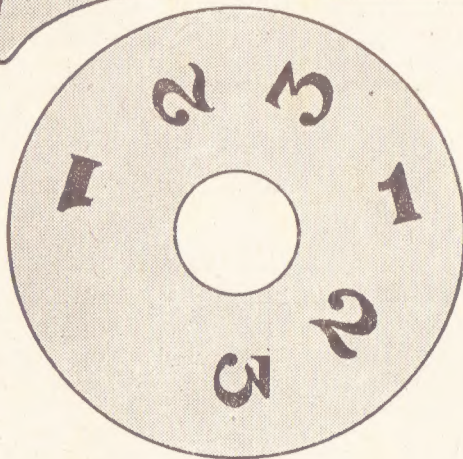
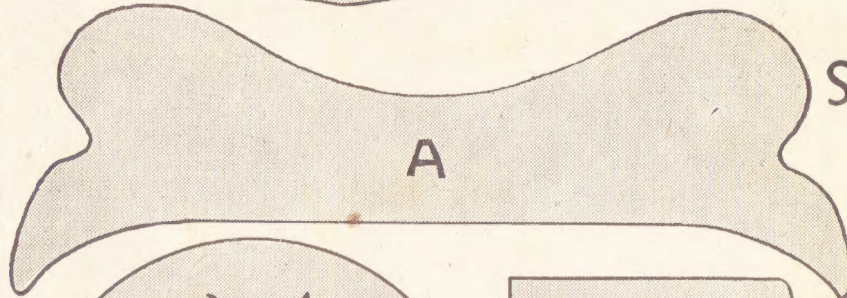
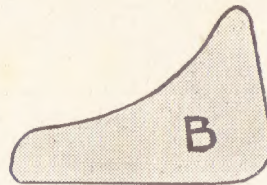
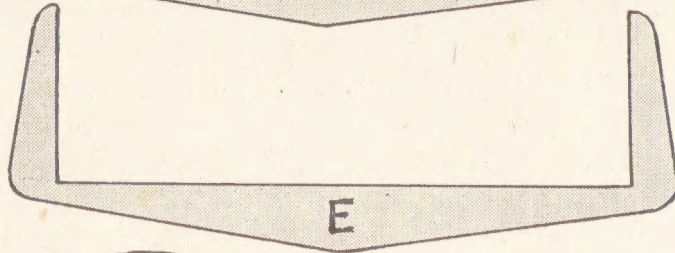
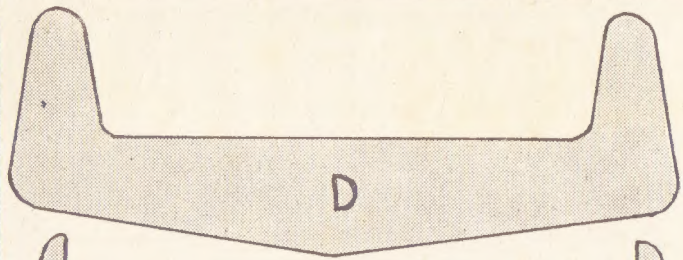
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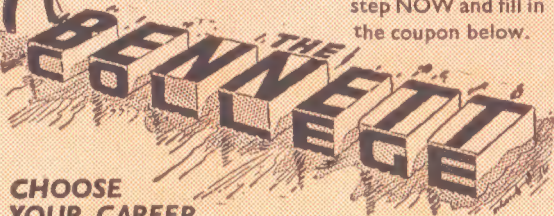
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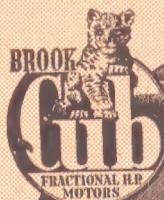
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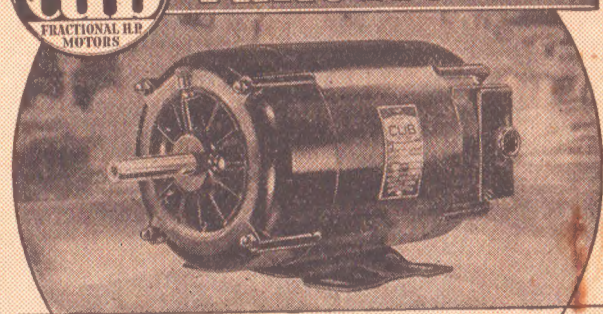
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